CONTINGENT EXTENSION REQUEST

If this communication is filed after the shortened statutory time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 CFR 1.136(a), to extend the time for filing a response to the outstanding Office Action by the number of months which will avoid abandonment under 37 CFR 1.135. The fee under 37 CFR 1.17 should be charged to our Deposit Account No. 50-2215.

REMARKS

The rejection of all pending claims under 35 U.S.C. § 103 over Batting in view of Slifkin is respectfully traversed.

Before the present invention, conductive inks and coatings were primarily based on solvent or water borne-thermal evaporated drying or on 2-component cross linking technology. While those compositions had high conductivity, they were slow drying and not suitable for high speed printing presses, as well as having other disadvantages. Energy cure systems had been made but these typically have significantly higher resistivity and reduced conductivity values compared to solvent or water-borne evaporated drying products. To achieve improved conductivity, increased pigment loadings were required which increased cost, and had a significant effect on the rheology and printability of the composition. The present invention is based, *inter alia*, on the discovery that the use of water-containing energy cure technology can resolve the problems of the prior art and enable the production of conductive inks which gave good

print definition, adhesion and which can be applied usefully by a high speed printing presses. The invention is not taught or suggested by the prior art.

Batting teaches a photocurable ink containing photocurable material, photoinitiator and water. It does not, as the Examiner has acknowledged, teach or suggest any type electrically conductive material be present. Further, nothing in this reference provides any suggestion that it would be an appropriate starting point for a conductive ink. Instead, it addresses the needs for a coloured printing ink for the decoration of paper billboard posters and in no way addresses the functional requirements for a high electrical conductivity composition with good print definition when printed onto multiple substrate types. If someone for some unknown reason was to consider Batting as a starting point and substituted conductive pigments for the aqueous toners pigments, detailed as component Y in its examples, then the composition would not have the desired adhesion as its system is designed for printing poster paper and not to give adhesion to multiple substrates including plastics as required in the present invention. Further, a high conductivity would not be expected because the high percentage (24.25%) of talc which present in all of the example compositions is avoided in the present invention as it dramatically reduces conductivity. Application paragraph [0045] points out that while fillers may be incorporated to modify the physical properties of the composition, if added, they should be present in small amounts.

Slifkin relates to a non-aqueous electrically conductive paste for making thick film conductors which contains a chemical which contracts on polymerization and a spherical metal powder pigment. The reference teaches the metal powder must be spherical, metal flakes not being suitable, and the chemical must contract so that the spheres are compressed together to promote good electrical contact. A problem

encountered is that when the paste is cured by ultraviolet radiation to achieve a thick film, the degree of cure is only about 95% so that the curable chemical in the formulation has not sufficiently contracted and the resulting product has significant resistivity. Therefore, a post-cure baking treatment is required to substantially reduce the resistivity. See the first paragraph on page 6. The need for this additional step obviously reduces productivity, and the need for heating means that heat sensitive substrates cannot be used.

The Office Action justifies the combination of the two references solely on the basis that they are "from the same field of endeavor, namely UV curable inks." However, a designation of the field of endeavor can be oversimplified and defined so broadly as to make almost any combination justifiable under this rubric, and it is respectfully submitted that has taken place here. Thus, Batting discloses a uv curable ink which can contain water while Slifkin concerns a non-aqueous paste and actually distinguishes that paste from "uv-cured inks" in the opening paragraphs of its disclosure. Moreover, the number of combinations based solely on an uv-curable "same field" approach is infinite, and as the MPEP points out, an obvious to try approach (which this is) is only permissible when the number of possibilities is finite. Section 103, which is the basis of the rejection, concerns whether it is obvious to combine two references and there must be a reason to combine the references proposed. For example, does one of the references provide a solution to a problem encountered by the other? The "same field" basis effectively says the two references are sufficiently related so that the skilled person would look for answers to problems in one reference in the other. Even if they are so related, the differences between the references must be taken into consideration.

Here, the Batting patent is concerned with providing an ink suitable for decorating paper substrates which are mounted on surfaces using an aqueous adhesive.

What problem does Batting have which may be addressed by anything in the Slifkin disclosure? None is discernable. Slifkin relates to totally different subject matter, namely, a paste which can be used to make a highly conductive thick film useful as a interconnective pattern in electronic circuits, as the Office Action points out. The reason for the combination which the Office Action asserts is that it would be obvious to use the Slifkin particles in Batting to make the Batting ink conductive. It is respectfully submitted that it is not valid for several reasons.

First, what is the reason that one would desired to make the Batting ink conductive in the first instance? Neither the Office Action nor the references themselves provide a reason. In fact, there is no reason at all for the combination here other than the need to force fit them into a template which is the claims under consideration. That is a retrospective approach and improper.

Second, even assuming that there was a reason to make Battling's aqueous ink conductive, why would the skilled person consult a reference relating to a non-aqueous paste, especially when there are known methods of making aqueous UV curable conductive compositions? See, e.g., US 4,322,331. As previously pointed out and as stated in the application, conductive energy curable conductive inks and coatings were known prior to the present invention. If one skilled in the art wanted to make the Battling composition conductive, such energy cure systems would be consulted, not art relating to thick film technology.

Third, substituting a conductive pigment for the pigments in Battling's examples would not provide the desired conductivity, as noted earlier.

Fourth, it is important to recognize that good conductivity is not the sole requirement for a useful conductive ink even though it may be for other types of compositions such as Slifkin's thick film paste. Inks need good print definition, for instance, they should be able to resolve 100 micron lines, and they also need good adhesion to a range of different potential substrates, such as print receptive polyester, polycarbonate, coated and uncoated paper/board stocks and polyimide substrates. Still further, inks need to be flexible if they are to be printed onto a flexible substrate, which is often desirable for a RFID tag. Thus, the fact that a material is conductive does not necessarily mean it can be used to formulate an acceptable ink. Batting's composition may have suitable characteristics for use as an ink but what is there to lead the skilled person to reasonable believe incorporation of Slifkin's conductive particles would not adversely effect those characteristics? There is nothing in the text of either reference which provides a basis for such a belief.

The Office Action acknowledges the claimed effects or physical properties are not taught by the references but asserts they would be implicitly achieved by a "composite", i.e., "the combination", with all the claimed ingredients. It is respectfully submitted that this proposition is nothing more that a statement that the claimed composition has its inherent properties, and is not a relevant consideration. Neither of the references standing alone discloses the "composite", i.e., the claimed composition, nor suggests that a "composite" would have those properties. It is not a relevant proposition because it is based on an after-the-fact viewpoint while Section 103 requires a before-the-fact viewpoint ("would have been obvious"). Therefore, the relevant inquiry is whether there would be a reasonable expectation that those properties would be realized if the

combination was made, i.e., was it predicable? The Office Action does not point to any reason it would be predicable and none has been found in the references.

Slifkin teaches it is necessary to effect a post-cure baking in order to achieve the conductivity desired even for a thick film conductor. If anything, Slifkin's teaching suggests that the claimed composition would not achieve the desired conductivity in an ink without a post-cure, an additional processing step which reduces productivity and is not suitable for use with heat sensitive substrates. The fact that the claimed invention achieves an ink with the desired conductivity without a post-cure, as shown in the working examples, is therefore surprising, unexpected and unpredictable.

The Office Action acknowledges that Slikin does not teach the particles would give rise to the claim recited resistivity of less than 1 ohm/square, but asserts it would be obvious to optimize particle content to achieve that result. Applicants respectfully disagree. It should be appreciated that the type of resistivity about which Slikin is concerned for his thick film is a three dimensional measurement, as reflected by the ohms cm units in which it is measured. In contrast, the type of resistivity referenced in the claims of this case is two dimensional, as reflected by the ohms/square units in which it is measured. These are not the same. Optimizing a ohms cm value will not necessarily give a 2-dimentional resistivity of less than 1 ohm/square. While applicants appreciate the Examiner's indication that a demonstration that an unexpectedly low resistivity is achieved without a post cure might be persuasive, it is respectfully submitted that a showing is not required in light of the failure of either reference to address a 2-dimentional resistivity of less than 1 ohm/square coupled with both the unexpected ability to achieve that value without a post-cure as demonstrated in the working examples, and the fact

noted above that Battling's examples contain a conductivity reducing (i.e., resistivity increasing) filler.

In view of the foregoing considerations, it does not appear necessary to comment on any other assertions made in the Office Action. Applicants respectfully submit that the rejection should be withdrawn and the pending application is in condition for allowance.

Dated: November 16, 2009

That submitted,

By /Edward Meilman/
Edward A. Meilman
Registration No.: 24,735
DICKSTEIN SHAPIRO LLP
1177 Avenue of the Americas
New York, New York 10036-2714
(212) 277-6500
Attorney for Applicant